



# Defense Logistics Information Service

## The NATO Codification System: The Key to NATO Standardization



**Logistics Data & IT Solutions**  
**Defense Logistics Information Service**

Deputy Chief, International Cataloging  
Division

Hart-Dole-Inouye Federal  
Center  
74 Washington Ave N Suite 7  
Battle Creek, MI 49017-3084



# Overview of Presentation

- **Basics about DLIS and the NATO Codification System**
- **Standardization initiatives of NATO Allied Committee 135**
- **Basics about the ECCMA Open Technical Dictionary (eOTD) and the partnership of ECCMA, DLIS, and AC/135**
- **ISC Is 22745 and 8000**





# America's Logistics Combat Support Agency

## Combatant Commanders



**Industrial  
Command  
s**

**Operatin  
g Forces**

## Services



**Government  
Partners**

**Industry  
Partners**

**Global Mission**

- 8 DOD Supply Chains
- 21,000 People

**Historic Levels of Execution**

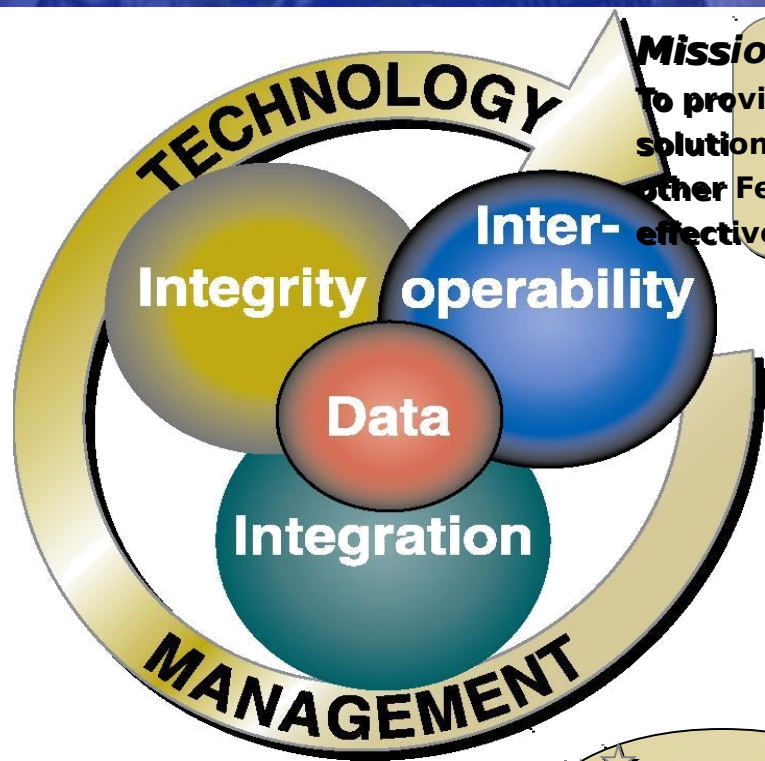
- \$35B Goods & Services
- OEF/OIF
- Disaster Relief Support

**Flexible World Wide Presence**

- Deployable Distribution
- Contingency Support Teams



# Defense Logistics Information Service



## Mission...

To provide interoperable, integrated, quality logistics data and enterprise solutions for joint warfighters, the Military Services, the Defense Department, other Federal agencies and international partners in order to optimize the effectiveness and efficiency of the DOD Supply Chain.

## Business Profile

- Federal Logistics Information System (FLIS)
- Military Engineering Data Asset Locator System (MEDALS)
- Technology Mgmt- DLIS/DRMS (Networks / IA / CM / Testing)
- Data Integration (LINK / AV / DESX / Meta Data / Master Data / IDE)
- Environmental Initiatives (HMIRS / ERLS / EPRO)
- Multi-media Information (CD/DVD / On-Line / Tailored Extracts)
- DOD Cataloging & Provisioning Support
- Software Development (Web / Legacy / Contemporary)
- Quality
- Solutions (CCR, ... / DC)
- National Center for

## Scope of

☆☆ **WORLD** ☆☆  
 Customer Interaction Center  
 DLIS-Support@dlis.dla.mil  
 1-877-352-2255  
**CLASS**

- \$601.9M DOD EMALL Sales
- 445,862 products distributed i.e. FEDLOG
- 148,446 accounts to online systems
- 9,334 extracts provided containing over 10.9B records
- 6.9M active NSNs in FLIS
- 41.7M technical data assets indexed in MEDALS
- 286K calls annually
- 52 critical applications / 97 total applications

*Our most valued resource...  
 our people...1,389 plus*

## Vision...

We are the premier provider of DOD supply chain data and logistics information technology solutions.



# The U.S. Cataloging System Today



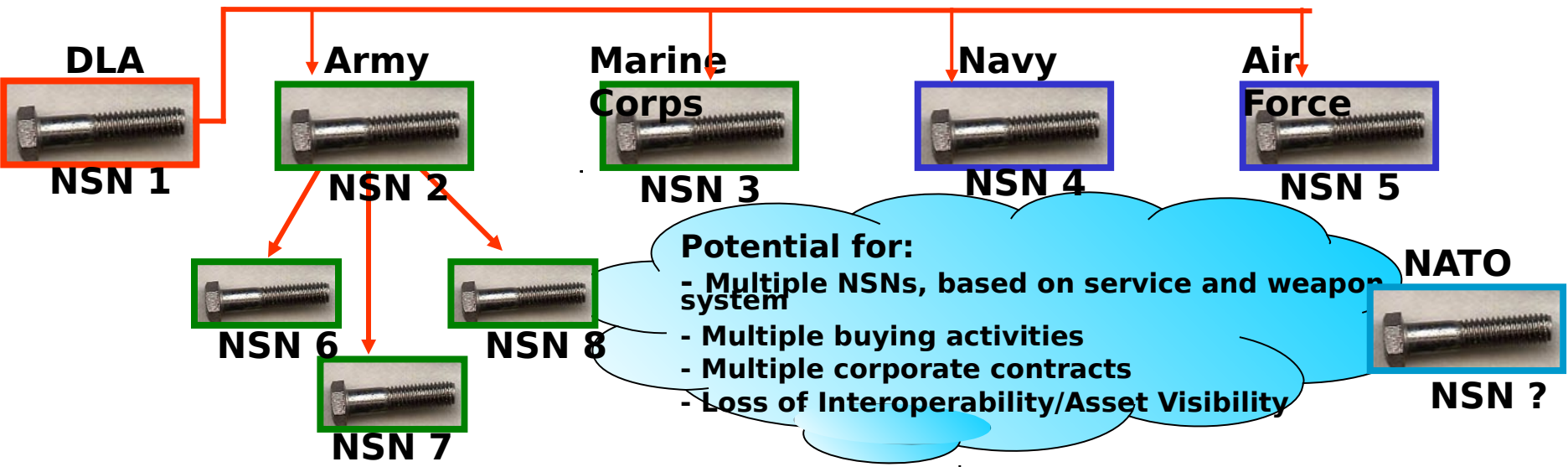
**DLA NSN 1**



**ONE ITEM OF  
SUPPLY  
SINGLE MANAGER  
  
SINGLE NSN**

**Each military service  
uses their own  
logistics "language"**

## In The Days of WWII

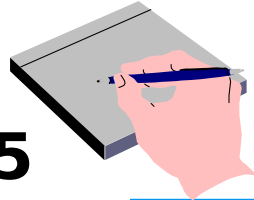




# Codification Chronology



1945



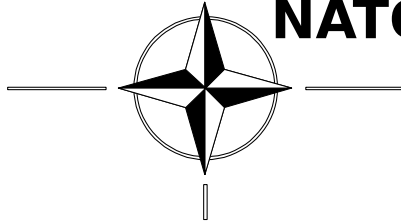
1949 PL152 SUPPLY CLASSIFICATION

US/UK/CA  
CLASSIFICATION

1952 PL436 CODIFICATION SYSTEM

1954 STANAG 3150

NATO 1956 STANAG 3151



1966 DLSC

1974

NCB



1978 CODE

1991 PFP

1994 PACS

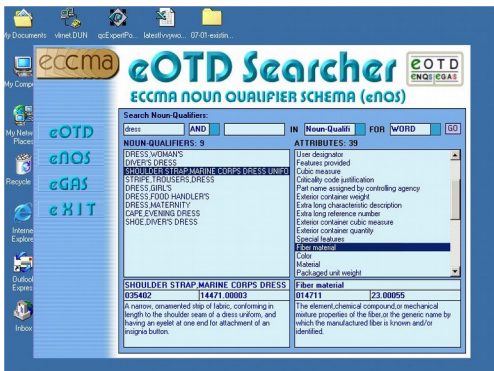
BASELOG

1999

e-Commerce 2002

eOTD / ISO

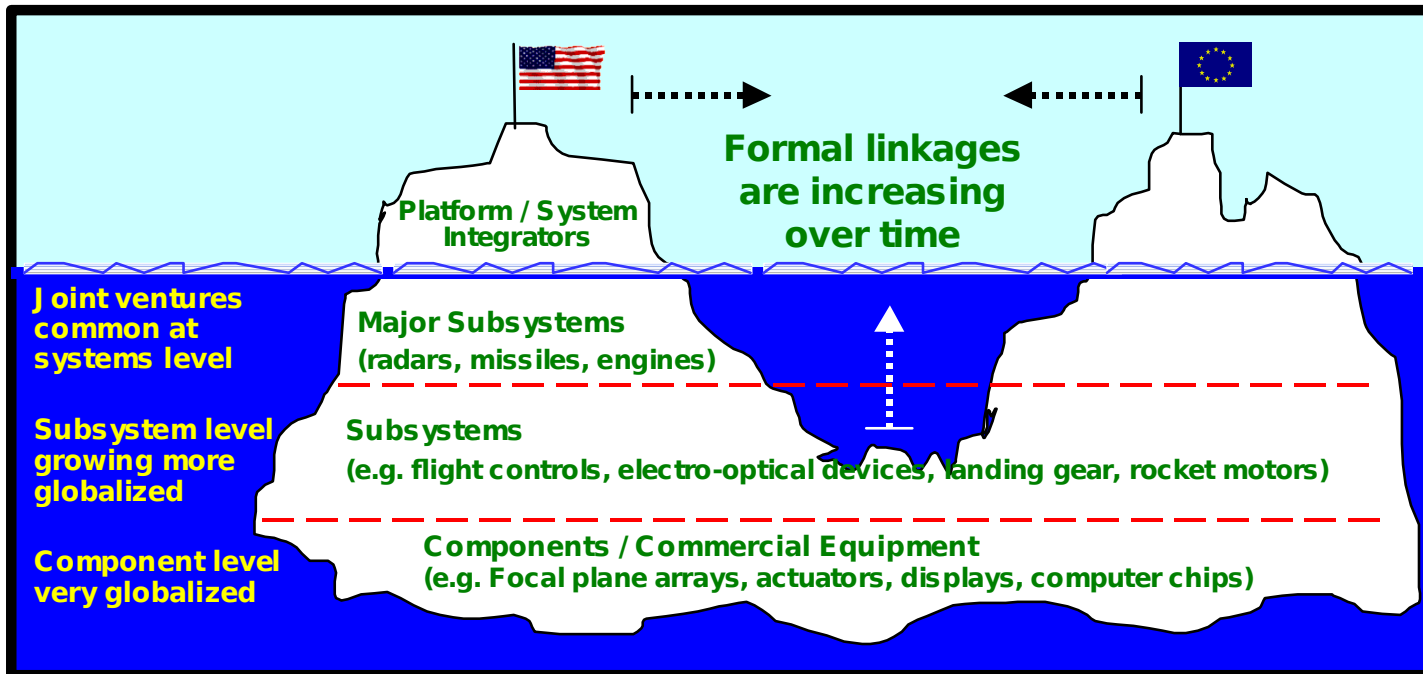
2007





# International Interoperability

## An Increasingly Integrated Industrial Foundation Among U.S. and European Allies





# Multinational Cooperation



## MULTINATIONAL SYSTEMS DEVELOPMENT



- |  |      |  |        |
|--|------|--|--------|
|  | ALN  |  | DASA   |
|  | AS   |  | FLABEL |
|  | BAE  |  | TAI    |
|  | CASA |  | OPEN   |



Source: Airt

## JSF Partner Nations



## LOCKHEED MARTIN JSF GLOBAL SUPPLIERS







# The NATO Codification System (NCS)

- A standard for logistic information exchange military units worldwide
- A flexible information system that can be tailored to national requirements
- An important cornerstone to Logistics Interoperability

**For more info:**

**<http://www.nato.int/structur/AC/135/redirect/800-e.htm>**

# NCS is Language Interoperable



**Help, I need  
NSN 6645-00-  
248-4925**

Saya ada NSN di  
dalam simpanan.  
(I have the NSN  
in stock)



Nie mam w  
zasobach NSN-a (I  
have this NSN in  
stock)



I don't have your NSN... but can order it.  
我沒有? 要的料號....., 但仍可以申請



Peaks saabuma varsti  
(I expect this item  
soon)



# What Is the NATO Codification System?

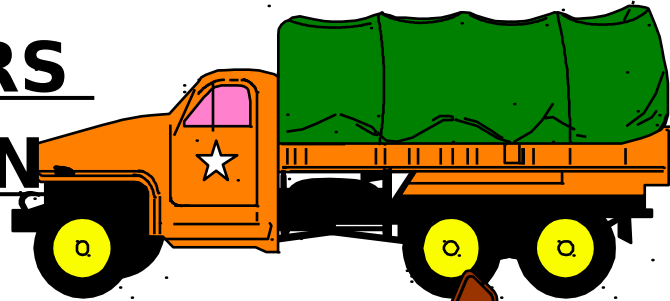
- Establishes a common supply language throughout all logistic operations using NSNs
- Based on the Federal Catalog System
- Enables interoperability
- Optimize resource management by minimizing duplication in inventories





# NATO Stock Number (NSN)

MANUFACTURERS  
IDENTIFICATION  
SYSTEM



USERS  
CODIFICATION  
SYSTEM

DUNLOP  
11-00-20SPTGM

GOODYEAR TIRE CO  
11-00-20SRLR

GOODYEAR FRANCE  
11-00-20UNISRL

CUP SNC  
1100R20GSRT4-16PR

NAVY  
ARMY  
AIR FORCE  
OTHER  
DEPARTMENTS

**2610-14-322460**  
Single Stock Number





# Item Description

- **Purpose: Determine NSN description changes**
  - Customer requirements
  - Best industry practices

## Characteristics

**AAEL - Threads per inch**

**AAJD - Thread class**

**AASK - Head Style**

**AASL - Head Diameter**

**AATR - Shank Length**

**AATT - Eye Offset**

**AAWX - Concentric Hole**

**Depth**

**AAXC - Concentric Hole Diameter**

**CQFM - Hardness Rating**

**CSXG - Offset Angle**

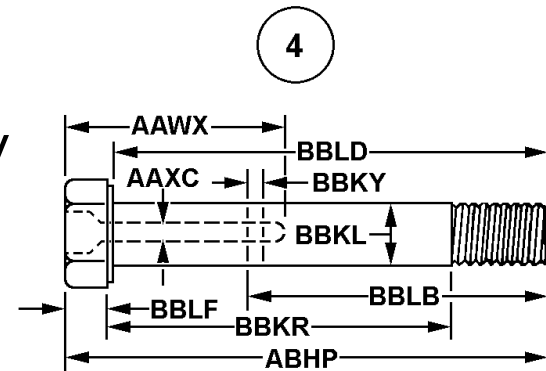
## Other Data

### Elements

- Hazardous

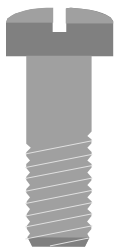
- Environmentally Friendly

- Precious Metals



PLAIN

**Line Drawing  
of a bolt**



**Picture  
of a  
bolt**



# NSN Statistics

- Approximately 16 million NATO Stock Numbers have been assigned
- More than 6 million by the U.S. and 9 million by the other NATO countries
- Approximately 31 million reference numbers have been registered on these NSNs
- Approximately 1.4 million manufacturers and other organizations are registered
- These NSNs contain more than 22 million user registrations



# Who Uses NCS Data?

- NCS data is used by soldiers, sailors, airmen and marines in 25 NATO countries and the 28 non-NATO countries that have been sponsored through NATO Allied Committee 135
- The NCS is also used by civilian government agencies in many countries and by many defense contractors
- NCS/NSN data is used across the entire logistics—from acquisition, maintenance and disposal



# Where Can NCS Data be Obtained?



- NATO products and publications
  - NATO Master Catalogue of References for Logistics (NATO MCRL)
  - NATO Ammunition Database (NADB)
  - Allied Codification Publications 2/3
  - National publications







# NSN Data in NATO MCRL

**NAMSA Application - Full Record Screen**

File Batch View Edit Help

Item Name (ACodP3): EXPANDER CARD,COMPUTER,AUTOMATIC DATA

NSN: 5998-01-400-2336    INC: 41220    Item Name (Segment A): EXPANDER CARD,COMPU    TIIC: 2    RPD MRC: 6    FMSN: 002

NIIN Assignment Date: 12/12/1994

**NCAGE Info**    --RN Codes--

NCAGE	Reference #	S	C	V	DAC	AA	F	J
28480	28696A	D	3	2	6	SZ	4	

Line # 1/1

**UNCCS**

UN Code	UN Name
452500	Expansion cards & other add-on hard- or firm-ware Add-on cards for EDP

Line # 1/3

Repl    Orig    <<    >>

Record 1/1

User	Country
ZC	Canada
ZT	Norway
ZZ	United States

Line # 1/3

Prev Screen

For Help, press F1

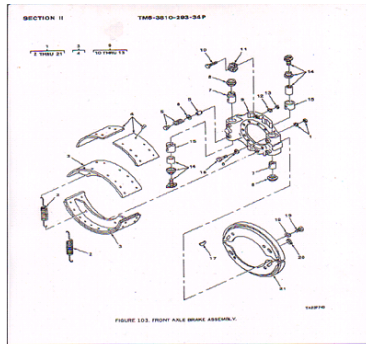
start    Disconnec...    Microsoft ...    3 Windo...    2 Micros...    CRM Mark...    Microsoft ...    NMCRL - N...    NAMSA Ap...    10:46 AM



# Codification In Logistics



## IN MAINTENANCE



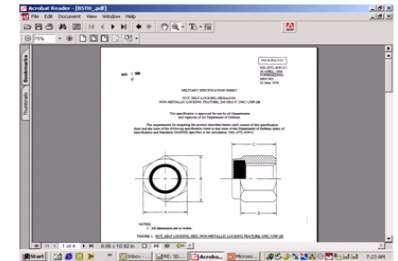
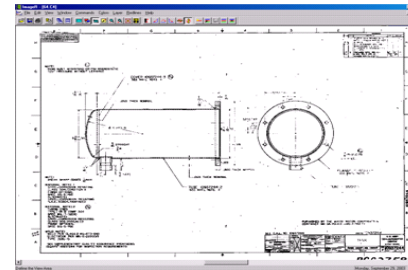
WHERE CAN IT BE ORDERED?  
HOW MUCH DOES IT COST?



## ACQUISITION AND PROCUREMENT

CAGE/PART NUMBER FOR  
(19207) 10937244 (96906)MS51922-017

ENGINEER DRAWING or SPECIFICATION



## IN WAREHOUSE



Is there Hazardous Content?

Does it give off an Electrostatic Discharge?

Does it have a Shelf Life?



## USE IN BUSINESS TRANSACTIONS

IF FOR DISPOSAL:

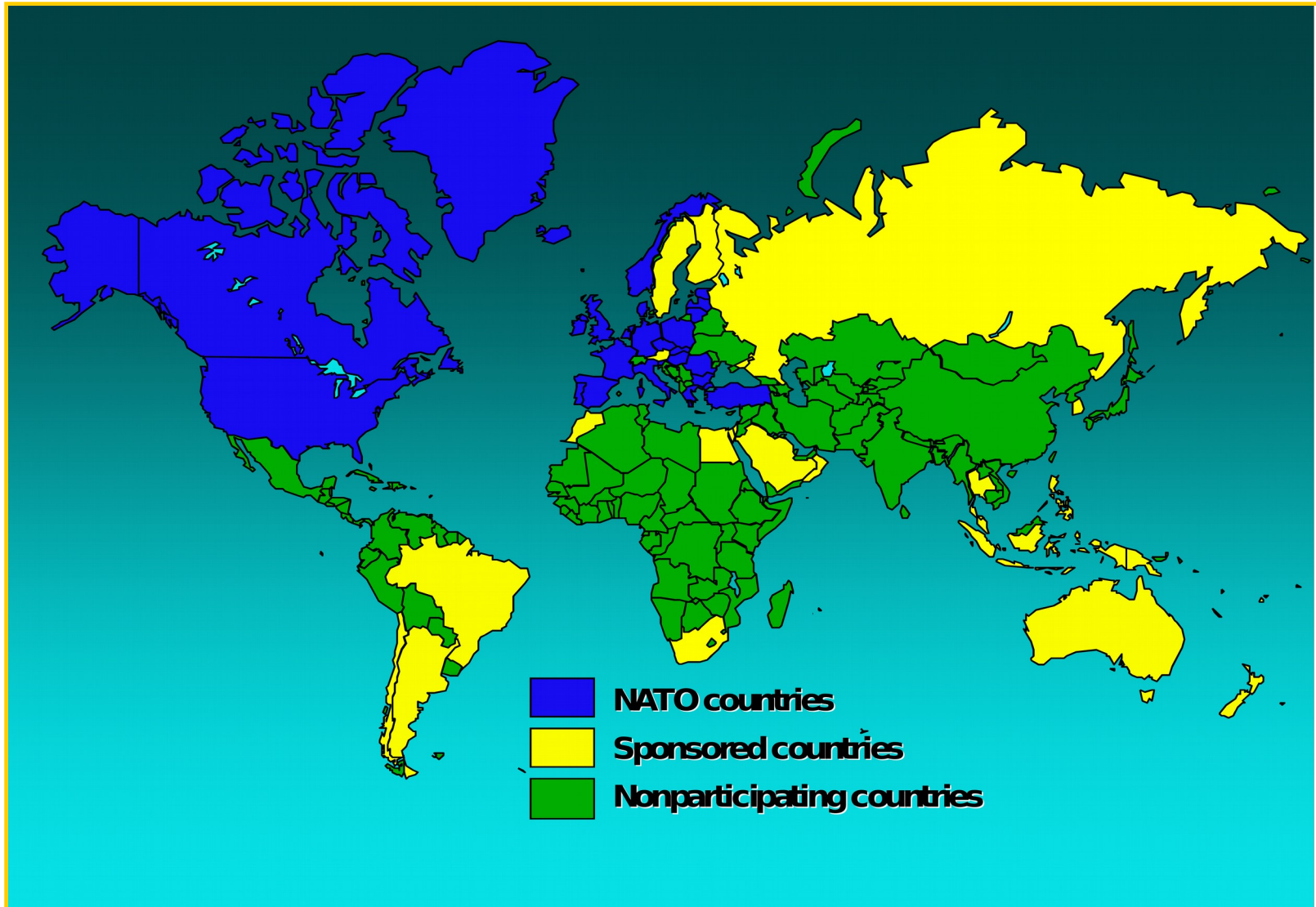
DEMILITARIZATION?

PRECIOUS METALS RECOVERY?



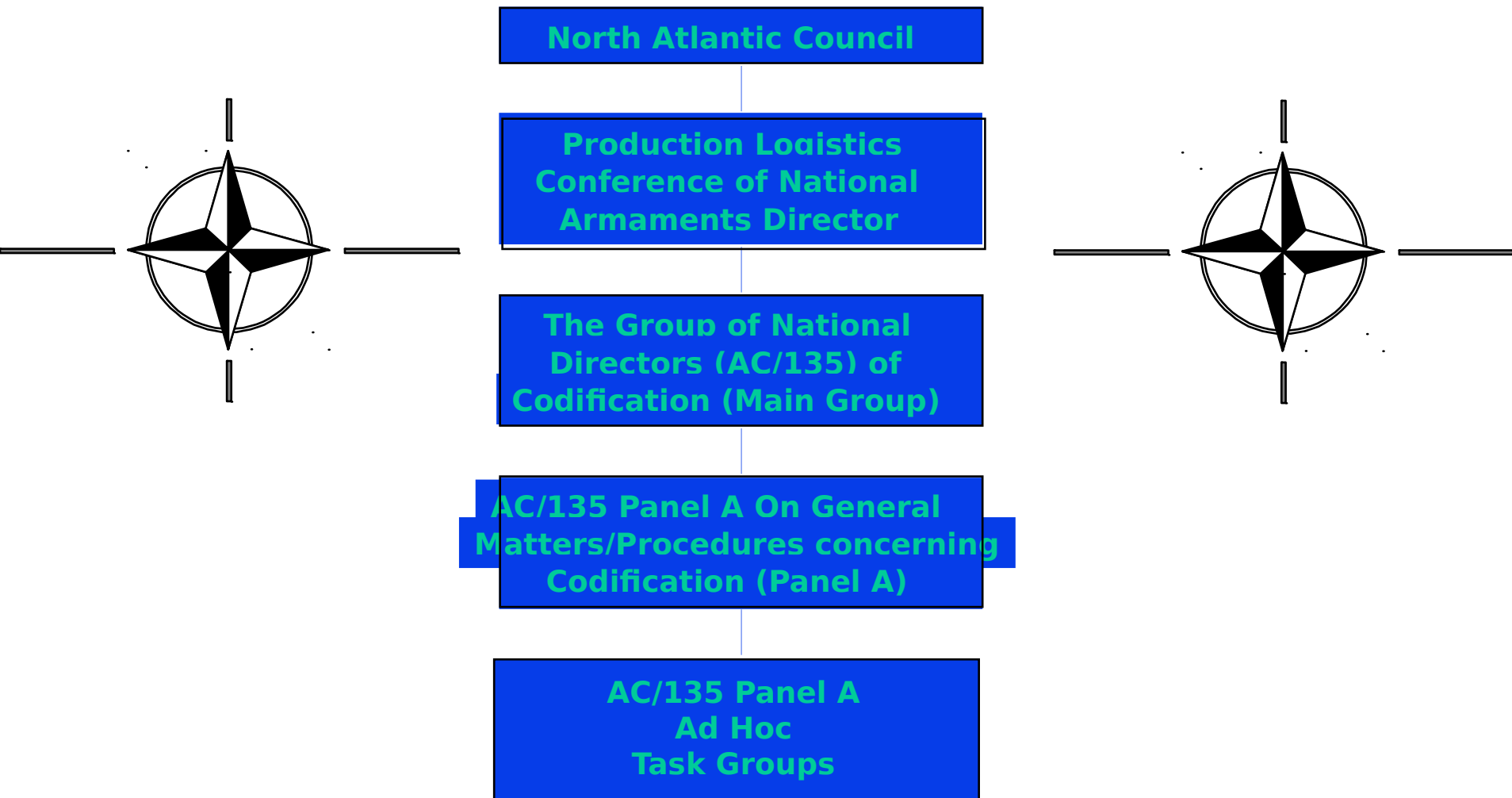


# Countries Using NATO System





# AC/135 Within NATO







# AC/135 and NATO Standardization

- Cooperates with NATO Agency for Standardization (NAS) and recently established an official liaison
- Active liaisons with Asset Tracking Working Group and AC/327 (Product Life Cycle Support)
- Has worked with Military Committee Terminology Conference (MCTC) on harmonizing terminology across NATO





# The ECCMA Open Technical Dictionary

- **The ECCMA Open Technical Dictionary (eOTD) was developed by ECCMA in partnership with DLIS and NATO Allied Committee 135**
- **ECCMA is the Electronic Commerce Code Management Association**





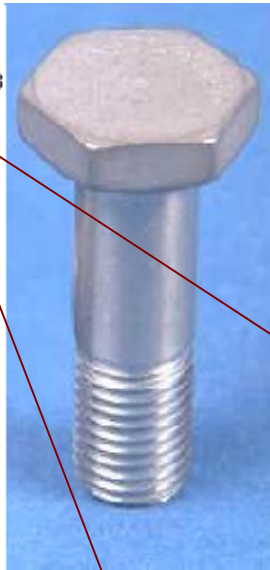
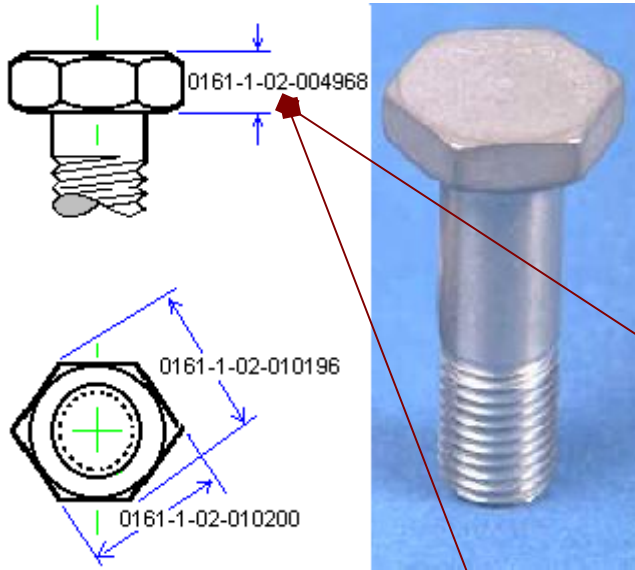
# The ECCMA Open Technical Dictionary

- **The ECCMA Open Technical Dictionary (eOTD) is an open technical dictionary of cataloging concepts used to create unambiguous language independent descriptions of *individuals, organizations, locations, goods and services***
- **The ECCMA Open Technical Dictionary (eOTD) is based on the NATO Codification System (NCS) with a more modern database architecture oriented toward the commercial world**



# Common Terminology = Common Mapping

**Machine Bolt; Product Number: 3225020037; Nominal thread diameter: 1.0 inches; Width across flats: 1.450 inches; Width across corners: 1.653 inches; Head height: 0.591 inches; Count per pack: 10; Pack price: \$0.80**



Property ID	Value	Measure ID
0161-1-02-046898	0161-1-07-014684	
0161-1-02-027375	3225020037	
0161-1-02-023822	1.0	0161-1-05-000798
0161-1-02-010200	1.450	0161-1-05-000798
0161-1-02-010196	1.653	0161-1-05-000798
● 0161-1-02-004968	0.591	0161-1-05-000798
0161-1-02-027376	10	
0161-1-02-027378	0.80	0161-1-08-000168

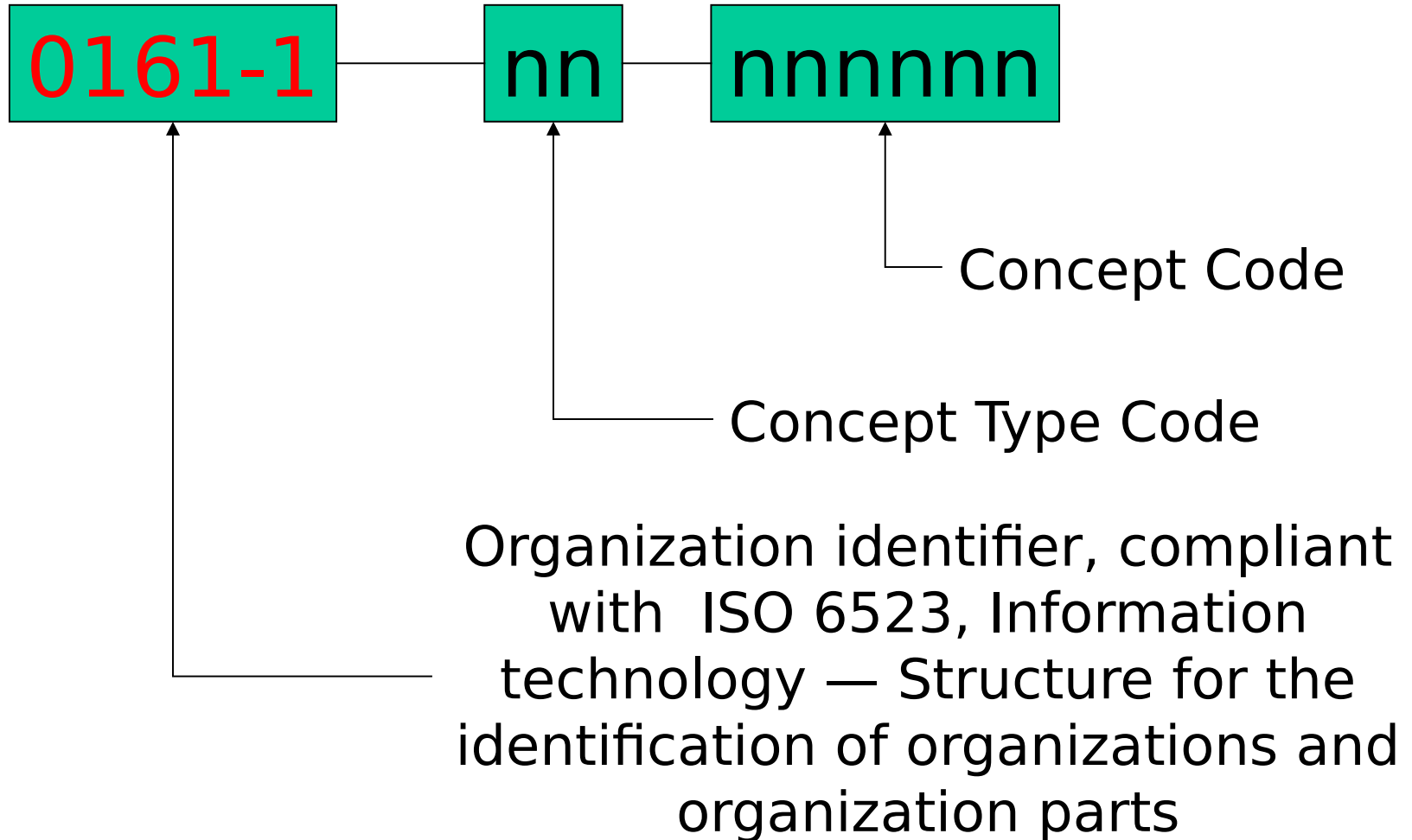


Property term	Value	Measure term
eOTD CLASS NAME	BOLT:MECHANICAL	
PRODUCT NUMBER	3225020037	
NOMINAL THREAD DIAMETER	1.0	INCHES
WIDTH ACROSS FLATS	1.450	INCHES
WIDTH ACROSS CORNERS	1.653	INCHES
● HEAD HEIGHT	0.591	INCHES
COUNT PER PACK	10	
PACK PRICE	0.80	US DOLLAR





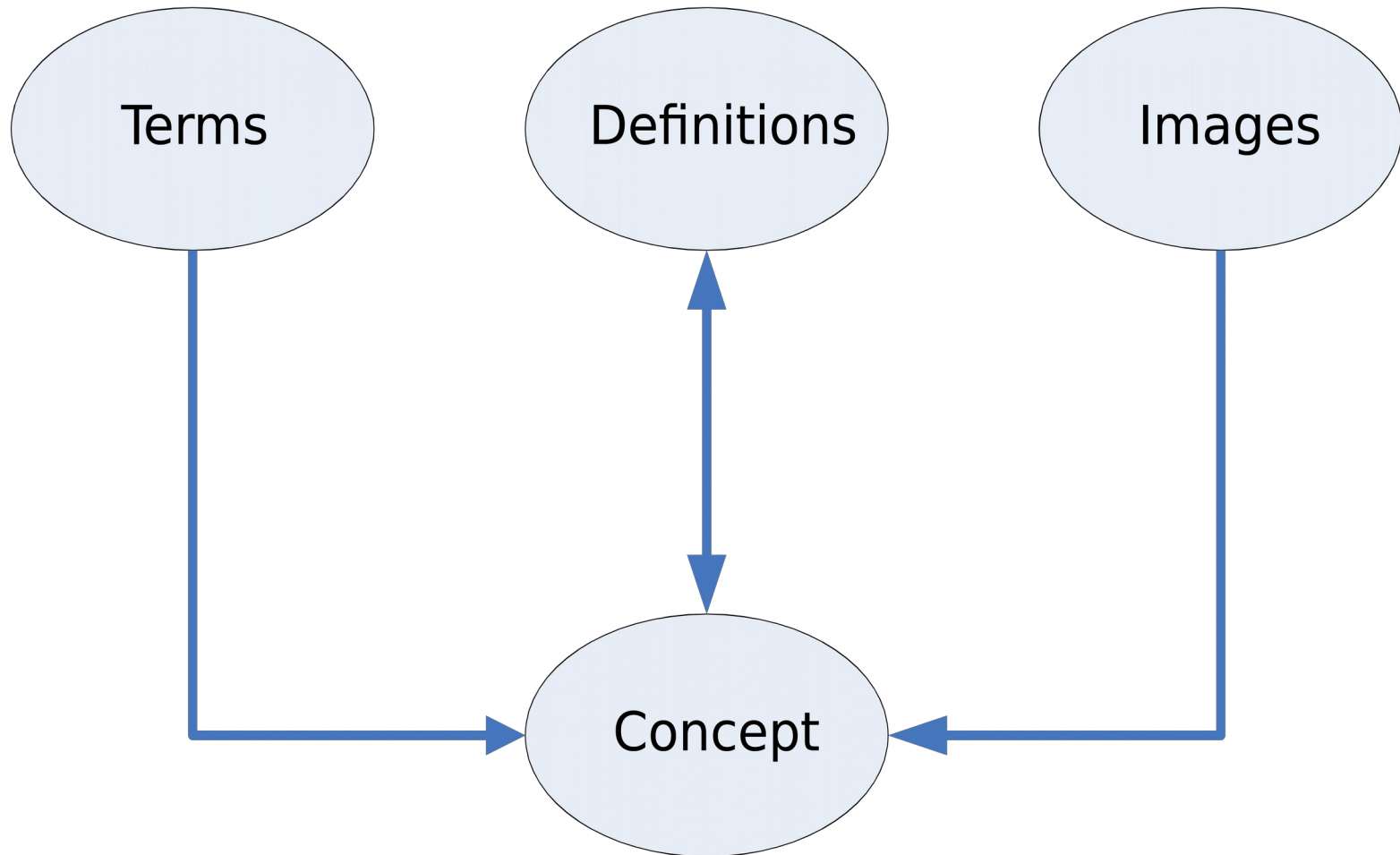
# Globally Unique Identifiers





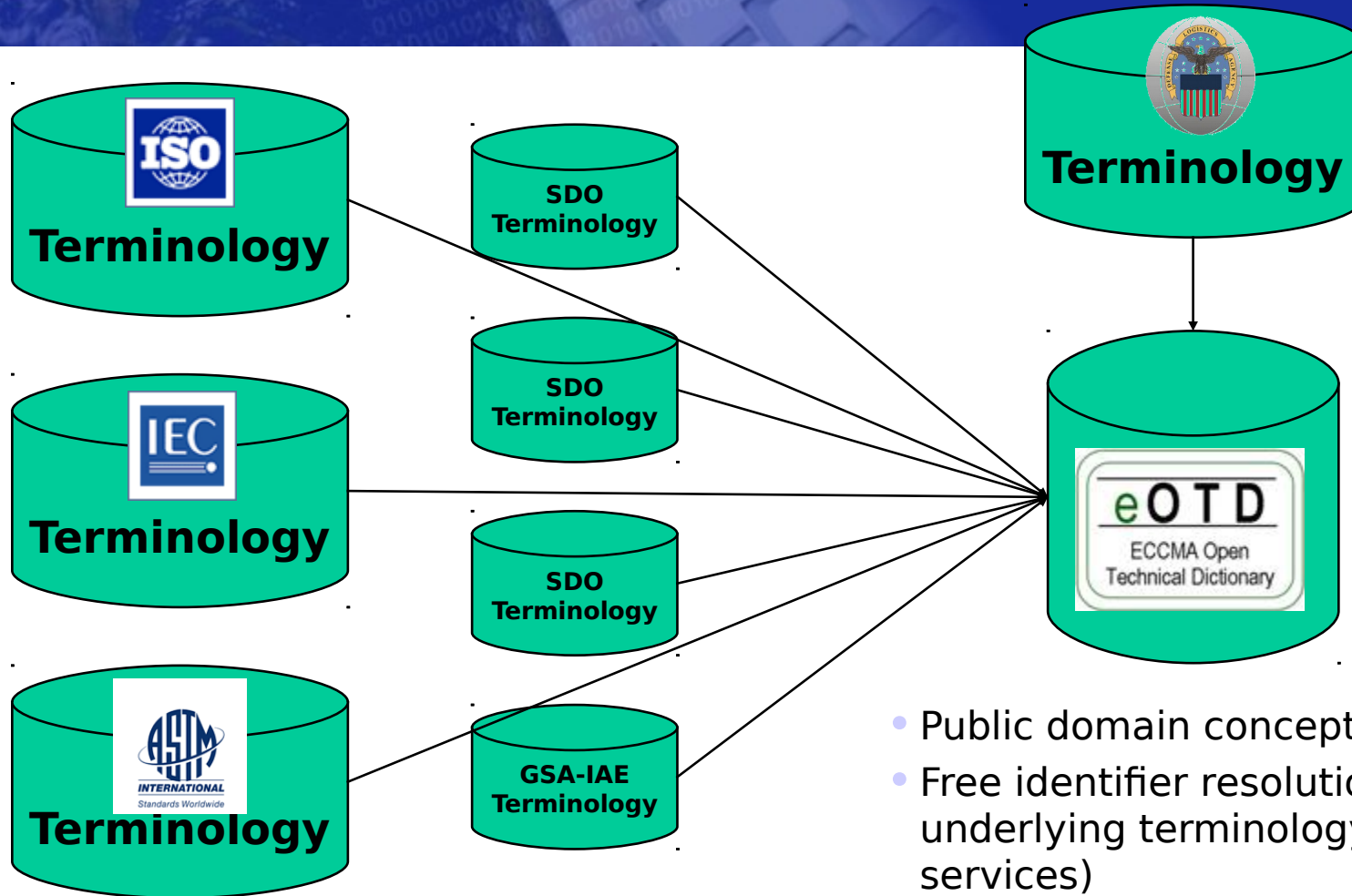


# eOTD Dictionary





# Standard Terminology



- Public domain concept identifiers
- Free identifier resolution to underlying terminology (web services)
- Hyperlink to source standards
- Multilingual
- Multiple terms, definitions and images linked to single concept identifier

Concept Detail: 0161-1-01-006362

### Concept Names

Name	Standard References
BALL SCREW	ISO/DIS 3408-1
BALLSCREW ASSEMBLY	FIIG A305

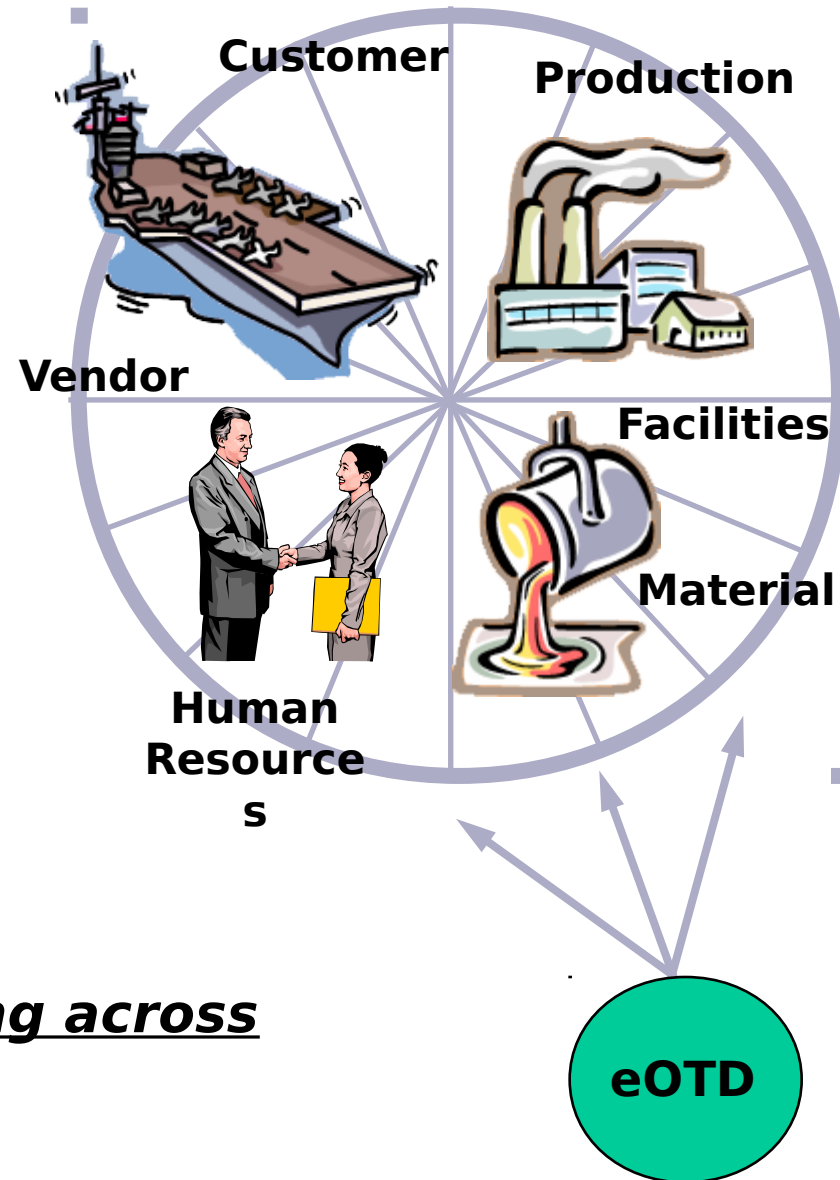
### Concept Definitions

Definition	Standard References
<p>An assembly comprising a ball screw shaft, ball nut (s) and balls, and which is capable of converting rotary motion to linear motion and vice versa. The rolling elements of the assembly are balls.</p> <p><i>Notes</i></p> <ul style="list-style-type: none"> <li>Depending on the application, ball screws are designed either with backlash or without backlash (preloaded).</li> <li>To meet individual requirements six standard tolerance grads 0, 1, 3, 5, 7 and 10 are available. The tolerances for travel deviation are in accordance with the standard tolerance grads IT0, IT1, IT2, IT5, IT7 and IT10 of ISO 286-1:1988, ISO system of limits and fits - Part 1: Bases of tolerances, deviations and fits. Usually standard tolerance grade 0 to 5 are preloaded, and grades 7 and 10 are not preloaded.</li> </ul>	ISO/DIS 3408-1
<p>A self-contained power transmitting device designed to convert rotary motion to linear (straight line) mechanical movement. Must be comprised of a ball nut, pillow block(s), screw shaft and such accessories as required for the specific moving and positioning of other components.</p>	FIIG A305



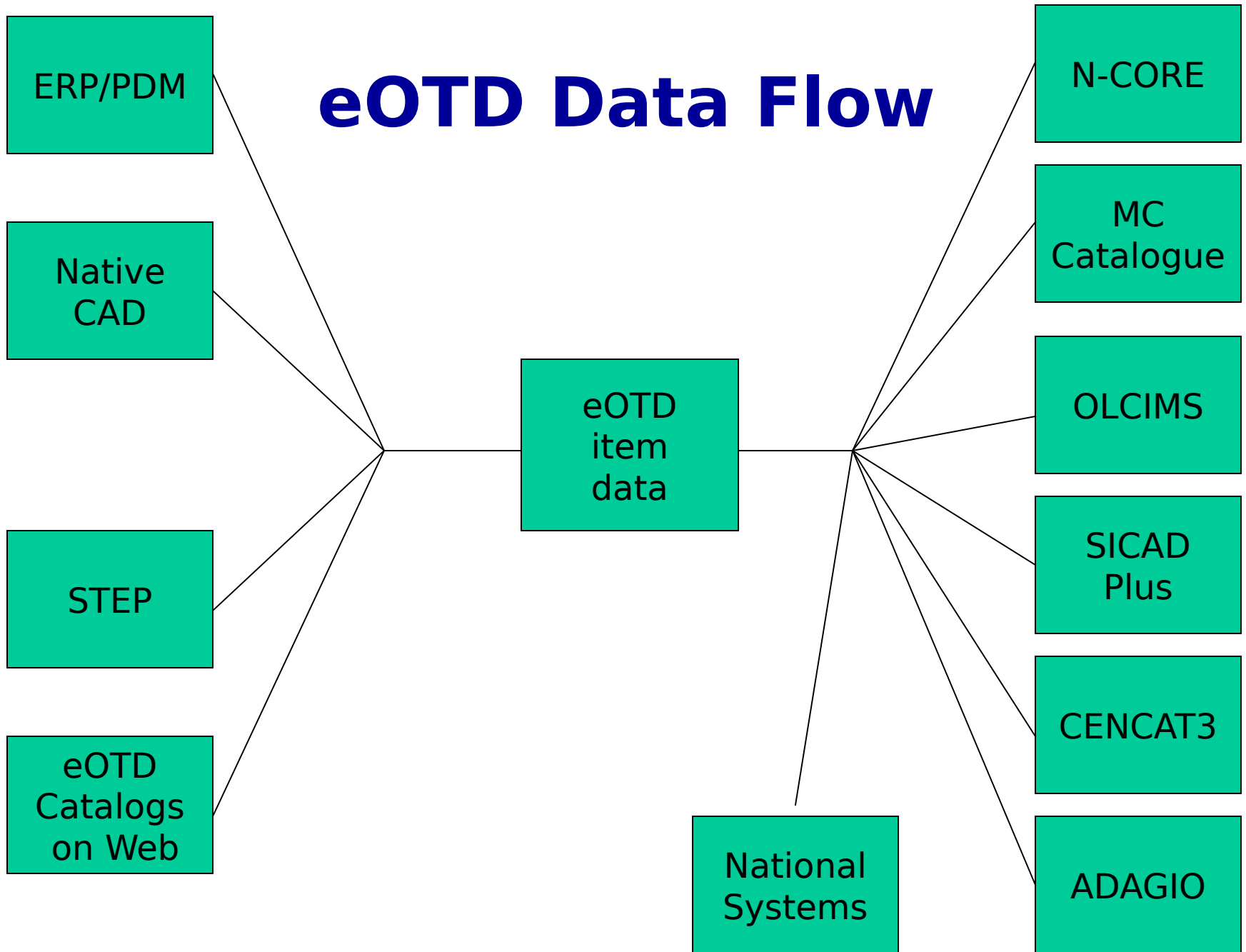
# Common Concept Encoding

- Across the supply chains
- ERP masters: vendor/customer/material
- Manufacturing/production
- Facilities/raw materials
- Human resources
- Data life cycle management – design through disposal



**Common metadata mapping across applications**

# eOTD Data Flow







# ISO 22745: eOTD as International Standard

- Fundamentals of ISO Standard 22745:
  - Embodies eOTD metadata into international standard
  - Integrates cataloging into design (CAD/CAM) files
  - ISO 22745 describes eOTD and explains how codification data can be tagged in STEP design files (ISO 10303) in a standardized manner
  - Mine Enterprise Resource Planning Systems (like SAP) for catalog data and convert to eOTD data





# Parts of ISO 22745

- Part 1: Overview**
- Part 2: Terminology: Defines the terms used in 22745**
- Part 10: Dictionary representation**
- Part 11: Guidelines for the formulation of cataloging terminology**
- Part 13: Identification of concepts and terminology**
- Part 14: Dictionary query interface: How to establish Web services interfaces for catalogs**
- Part 20: Procedures for the maintenance of an Open Technical Dictionary**
- Part 30: Identification guide representation**
- Part 40: Catalogue representation**

Parts shown in red are being designed jointly with Parts Librarian team and will be published in ISO 29002





# Parts of ISO 22745

**Part 50: Structure and operation of the Registration Authority\**

**Part 200: Implementation guide for incorporating cataloguing information into ISO 10303 product data**

**Part 300 Generic templates for commonly used types of master data**

- **Organization master**
- **Material master (equivalent to NSN data)**
- **Asset master**
- **Service master**
- **Process master**
- **Location master**
- **Person master**
- **Material Safety Data Sheet (MSDS)**



# Transformation Through Automation

## Before

- use of disparate sources of non-digital design data
- reliance on potentially subjective human judgment
- operate as an additional process

## After

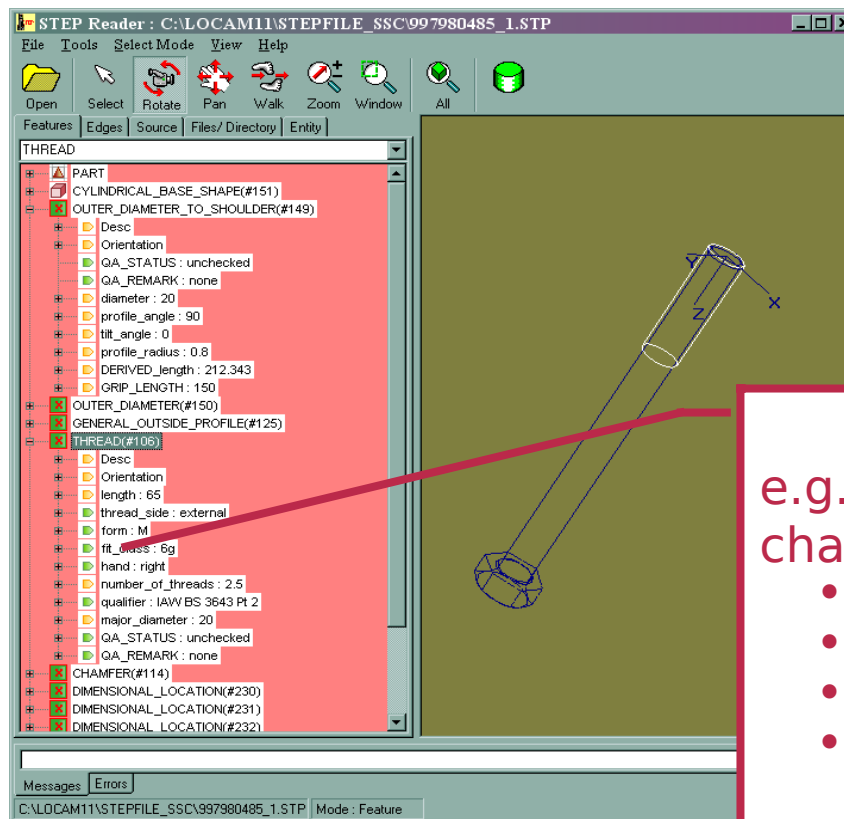
- use of digital design data in standard formats
- support for cataloging decisions in computer software
- perform cataloging at design time (cataloguing at source)

impact: faster, better, cheaper



# ISO 22745: Automation of Cataloging

- **Mapping Catalog Data from Source Data**



## features

- e.g. thread characteristics including
- length (65 mm)
  - form (ISO M)
  - class (6G)
  - diameter (20 mm)





# ISO 22745: Automation of Cataloging

- **Create data one time and use throughout life cycle**

The screenshot displays the STEP Reader application window titled "STEP Reader : C:\LOCALM11\STEPFILE\_UKNCB\BOLT\_MACHINE.STP". The interface includes a menu bar (File, Tools, Select Mode, View, Help), a toolbar with navigation icons, and a main workspace with tabs for Wireframe, Web, Image, and Text. On the left, a "FEATURES" tree shows a hierarchy with "CYLINDRICAL\_BASE\_SHAPE1" expanded to reveal "THREAD(#1029)". The "THREAD" feature has several properties listed: Desc, Orientation, length : 38, thread\_side : external, form : M, fit\_class : 6g, hand : right, number\_of\_threads, pitch\_diameter : 14.5E, and major\_diameter : 16. The "Text" tab is active, displaying a definition: "When the source document specifies a maximum and n or within the limits of a standard class of thread, reply wi class of fits should be reflected by the similar class of th class).". A dialog box titled "997980485\_1" is open, containing a text entry field with the text "Typically 6g, 4H etc" below it. A "Please NOTE:" section provides instructions: "The Thread Class is found by expanding the THREAD Feature in the STEP Reader Feature Tree. The Thread Class is reference as 'fit\_class'. The definition of Thread Class is displayed in the 'Text' tab of the STEP Reader".

**definition of the property from the Implementation Guide**

**thread class is found by browsing through the feature tree**

**data entry field**



# Benefits to Government

- **Opportunities for improvement of FLIS and the NATO Codification System through increased industry participation**
- **Promotes FCS/NCS approach as an ISO standard**
- **Lower cost of cataloging: Reduction of labor hours**
- **Higher quality data through direct import of data from manufacturers catalogs**

**Goal: Electronic transfer of descriptive data from our suppliers and manufacturers to NCBs**

# The Value



52368965412 - Tyre  
Bridgestone 435/95 R25



56329845 - Tyre BS 435/R25 Standard  
Purpose E3 2 Star Radial



125435 - Bridge Stone 25inch 435/95



965123465 - Tyre Bridgestone Part  
Number 12345



## One Common Anglo Number

### **Standardised Long Description:**

Tire: Pneumatic, Vehicular: Service Type for Which Designed: Loader Tire Rim Nominal Diameter: 25' Tire Width: 445mm Aspect Ratio: 0.95 Tire Ply Arrangement: Radial Ply Rating: 2\* Tire & Rim Association Number: E3 Tread Material: Standard Tire Air Retention Method: Tubeless Tire Load Index and Speed Symbol: NA Tread Pattern: VHB TKPH Rating: 80

### **Standardised Short Description:**

Tire Pneumatic: Loader 25' 445mm 0.95 2\*



***“Boeing currently buys 200 different kinds of safety glasses and 80 different shades of white paper. The defense and commercial aircraft divisions each negotiate for their own aluminum and titanium. Why can't we buy two or three kinds of safety glasses? Why can't we have standard part numbers that go across the enterprise?”***

**James F. Albaugh, CEO Boeing Integrated Defense Systems,  
Business Week March 13, 2006**

**The eOTD is a foundation for design collaboration and industry standards.**

ISO 22745 and the eOTD are the foundational enablers for the breakthrough our industry needs in the next generation of direct, accurate, and effective collaboration across the supply chain at meaningful and granular levels of data exchange never before imagined.

Senior Manager,  
IDS Engineering Standards Control Function  
PW Knowledge and Reuse Management (KARMA)

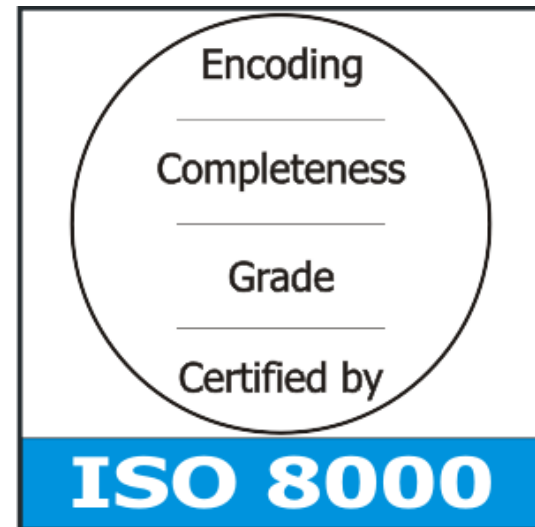






# ISO 8000: A Standard for Data Quality

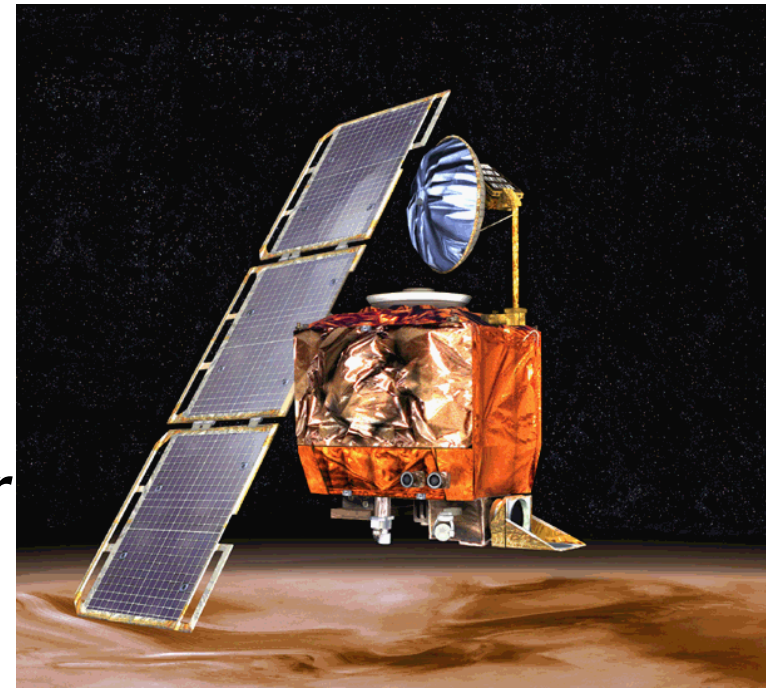
- Fundamentals of ISO Standard 8000:
  - Set standards and a certification process for data quality
  - Encompasses data quality but can easily be extended into all types of data quality
  - Defines different areas of data quality
    - Provenance
    - Traceability
    - Currency
    - Completeness



# How Expensive Can Bad Quality Data Be?

In this case \$125,000,000

*The price of a Mars Climate Orbiter*



Mars Orbit Insertion Burn	M/D/Y HH:MM:SS PDT (Earth Receive Time, 10 min. 49 sec. Delay)	Distance (miles)	Speed (miles/hr)	Force (Pounds)
Begin	9/23/99 02:01:00	121,900,000	12,300	143.878
End	9/23/99 02:17:23		9,840	

Mars Orbit Insertion Burn	YYYYMMDD EDT (Earth Receive Time, 10 min. 49 sec. Delay)	Distance (km)	Speed (km/sec)	Force (Newtons)
Start	19990923 05:01:00	196,200,000	5.5	640
Finish	19990923 05:17:23		4.4	



# Data Quality



*YOUR POINTING AT IT WON'T HELP - THE COMPUTER RECORDS SHOWS NONE IN STOCK.*



# Benefits of ISO 8000

- **Saving money right from the start**
  - **\$1 to correct an error at data entry**
  - **\$10 to correct a number of errors after the fact with batch processing**
  - **\$100 cost of not correcting an error**



- **Benefits**

- **Eliminates time to reconcile data**
- **Alleviates customer dissatisfaction**
- **Prevents loss of system credibility**
- **Eliminates system downtime**
- **Prevents some revenue loss**
- **Assists with compliance issues**

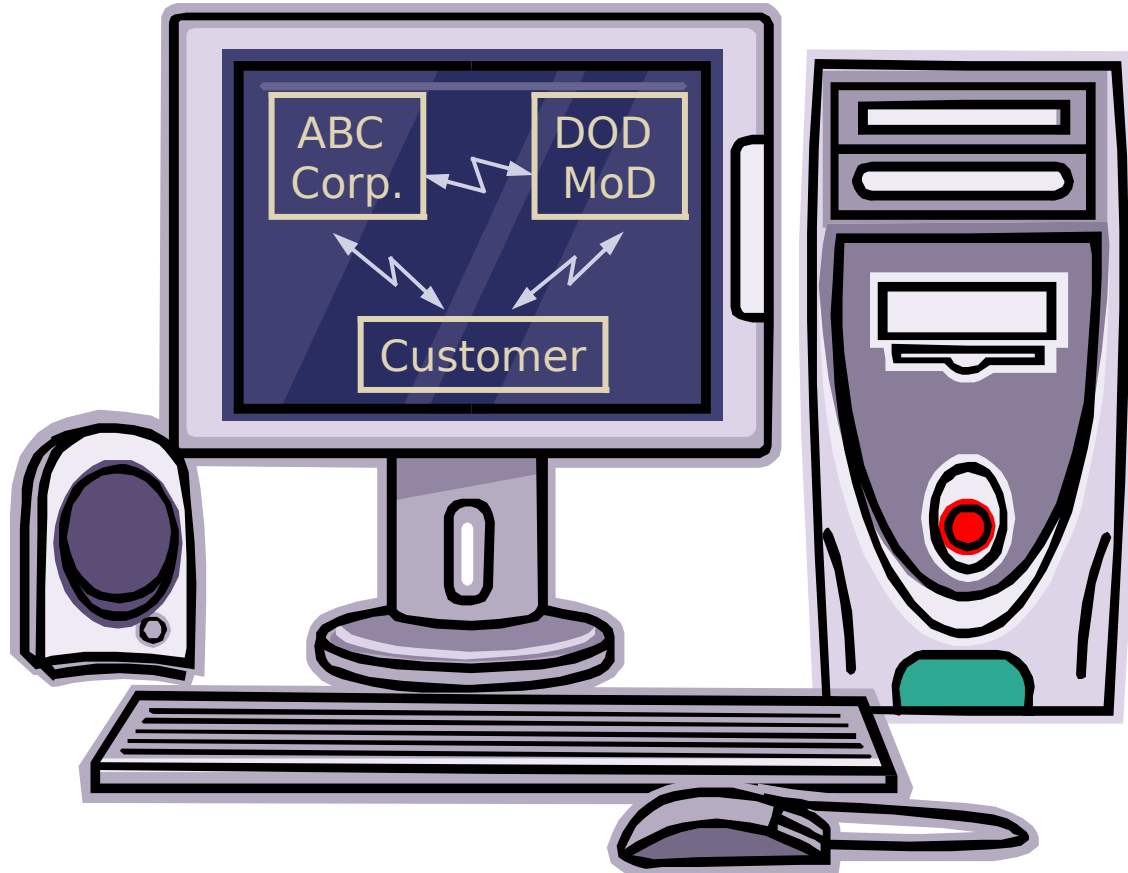




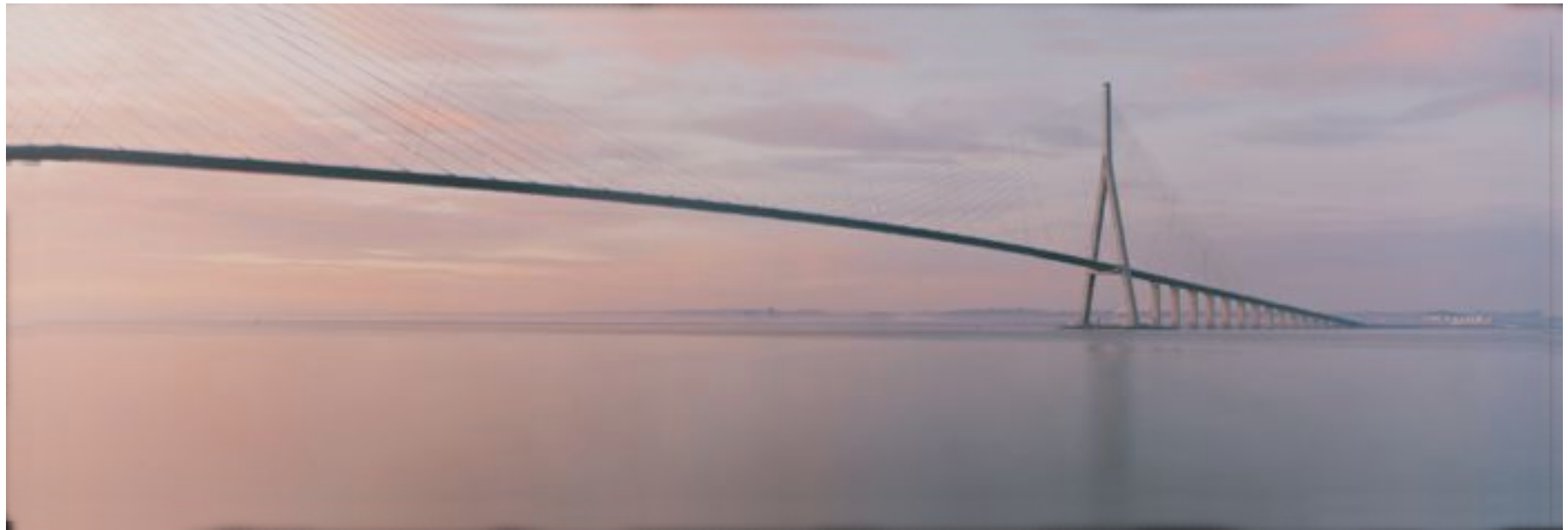


# Future Vision

- eOTD encoded information in XML resident on government and industry websites
- Accurate and seamless data retrieval



# The NATO Codification System



The Bridge to Interoperability